DVE OPERATOR COURSE

STUDENT GUIDE

VERSION 2.0

1 OCTOBER 2012

Operate the DVE

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Operate the DVE

TLO

ACTION: Operate the AN/VAS-5A DVE

CONDITION: Given a classroom/ training area, DVE, TM 11-5855-311-12&P 2,vehicle

STANDARD: Operate the AN/VAS-5A IAW TM 11-5855-311-12&P-2

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Operate the DVE

ELO A

ACTION: Identify the characteristics, safety, warnings, cautions and notes associated with the DVE

CONDITION: Given a classroom, TM 11-5855-311-12&P-2

STANDARD: Identify the characteristics, safety, warnings, cautions and notes associated withy the DVE IAW the operator manual

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Operate the DVE

General Safety

- Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid
- Power supply to the equipment must be shut off before working on equipment
- Adhere to the unit load plans and perform pre-combat checks
- Be careful not to contact high voltage connections or 115 volt AC input connections when installing or operating the equipment
- Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body

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Operate the DVE

General Safety Information

There are three conditions that can cause operations with the DVE to be unsafe

Training

Operational

Reduced Visibility

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Operate the DVE

General Safety Information

Training

All training and licensing of DVE operators will be conducted according to Chapter 8, AR 600-55

Training should be recorded on each individual's Operator's Qualification Record (DA348-1-R) and U.S. Government Motor Vehicle Operator's Identification Card (OF-346)

Once trained, personnel should utilize the DVE System frequently to prevent skill erosion

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Operate the DVE

General Safety Information

Operational

Improper use of the DVE System (failure to observe safety precautions) could result in Death, Severe Injury, or System Loss

Follow these guidelines to prevent these hazards:

At night with lights off, the vehicle commander **must wear NVG's**, be trained on the NVG's, and be familiar with the operating characteristics of the vehicle

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Operate the DVE

General Safety Information

Operational (cont.)

Before operating the vehicle ensure the following:

- Ballistic Helmets will be worn by all occupants at all times while operating vehicles
- Verify DVE azimuth on the DCM is set at 0° and elevation indicator is between 0° and -12°
- Ensure locking knob teeth on the DCM mount are fully engaged. Failure to do so may cause injury to personnel
- Adjust vehicle seat if possible (screen should be at eye level)

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Operate the DVE

General Safety Information

Operational (cont.)

- Do not adjust the system while vehicle is moving
- The driver and co-driver must actively search for personnel or objects in/adjacent to the road during vehicle operations due to the restrictive 40 x 30 degree DVE System FOV – objects in front of and close to the vehicle may not be visible
- Stop or slow down sufficiently when approaching intersections until the driver and co-driver can verify the absence of approaching cross traffic

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Operate the DVE

General Safety Information

Operational (cont.)

- Slow the vehicle to 5 mph or less when approaching personnel at the side of the road until vehicle operator can ensure that all personnel have been passed
- Unassisted backing is not permissible while using the DVE system, ground guides must be used
- Operating speed will vary according to conditions and the driver's experience. Do not 'outdrive' the DVE
- Looking too far down the course – cannot see upcoming / immediate hazards
- Driving too fast – Not enough time to react to hazards

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Operate the DVE

General Safety Information

Operational (cont.)

Drivers and vehicle commanders must use good judgment. Consider existing road and environmental conditions in determining safe operating speeds. Do not exceed the following operating speeds:

• Primary/Paved Roads	35 mph
• Secondary Roads	25 mph
• Off-Road Surfaces	10 mph
• Hilly Cross-Country	10 mph

Limited Field Of View – Slow down sufficiently and use extreme caution when approaching curves and especially right-hand turns

The DVE System is safe for planned use provided the above requirements are followed. All operators must be made aware of precautions listed above during New Equipment Training

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Operate the DVE

General Safety Information

Reduced Visibility

Failure to account for the reduced DVE System field of view or degraded environmental conditions could result in Death, Severe Injury, or System Loss

Follow these guidelines to control reduced visibility

Check the integrity of the DCM and the position of the SM prior to each driving operation

The DVE System is not a "see-all" device. Objects may not be readily detectable due to dense fog, smoke, heavy rain, and thermal neutral conditions (diurnal cycle)

Maintain environmental and weather condition awareness, reduce speeds to suit the prevailing operational environment and terrain

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Operate the DVE

General Safety Information

Reduced Visibility (cont.)

- Driver fatigue and eyestrain are directly related to use of the DVE System. To reduce driving accidents, provide operators with periodic breaks; minimally every two hours while using the DVE System
- Staring too closely at the DCM can cause headaches, dizziness (vertigo), and / or vision impairment. Operator should occasionally look away
- Transitions in terrain (drop-offs, bumps, etc.) are often difficult to identify and may not clearly be defined on the DCM

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Operate the DVE

General Safety Information

Reduced Visibility (cont.)

- If at any time the image becomes degraded or the operator feels unsafe with the driving situation while using the DVE system, stop the vehicle and discontinue use
- Immediately bring the vehicle to a safe halt to avoid collision if the following situations occur:
  - **Dead Pixels** – The small dots that make up the display degrade to the point that the DCM image becomes unviewable
  - **Video Noise** – Interference or static that blots out the display
- If unable to troubleshoot, report situation to higher level maintenance

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Operate the DVE

General Safety Information

Reduced Visibility (cont.)

Because DVE System looks forward, intersecting pathways will disappear from the driver's FOV prior to the vehicle entering the intersection

The EPTM can assist in making turns

- Stop the vehicle
- Survey the area around the vehicle, utilizing the Electronic Pan and Tilt Module (EPTM)
- Plan proper action
- Return the SM to home position (0° azimuth) and proper elevation
- Proceed

Slow vehicle to comfortable turning speed

Adjust turn rate as path comes back into view on display

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Operate the DVE

Warnings, Cautions and Notes

Warnings – Operating or maintenance procedure, practice, or condition that if not adhered to could result in injury or death to personnel

Cautions – Operating or maintenance procedure, practice, or condition that if not adhered to could result in damage or destruction of equipment or loss of mission effectiveness

Notes – A statement that clarifies the following procedures; it cannot replace an essential operating or maintenance procedure

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Operate the DVE

AN/VAS-5A(B) Viewer, Infrared System

DVE Major Components consist of:

Display Control Module (DCM)

Sensor Module (SM)

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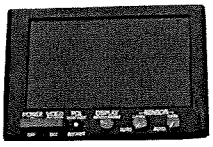
Operate the DVE

Characteristics and Capabilities

DISPLAY CONTROL MODULE (DCM)



- Depth 4.19 inches (Maximum)
- Width 10.47 inches (Maximum)
- Height 8.98 inches (Maximum)
- Weight 8.25 pounds (Maximum)
- Power Dissipation 86 watts, (Maximum)(During warm-up)
  30 watts, (Maximum) (Nominal)

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Operate the DVE

Sensor Assembly

- Detects IR energy
- Converts IR image to video signal
- Sends video signal to DCM
- Detects a standing person or a 22 inch (55.9 centimeter) object at 360 feet (110 meters) or greater
- Operates from a single input voltage of 16 to 32 VDC

• Width	3.64 inches
• Height	5.25 inches
• Depth	3.88 inches
• Weight	2.73 pounds (Maximum)
• Power Dissipation	10 watts (Maximum)

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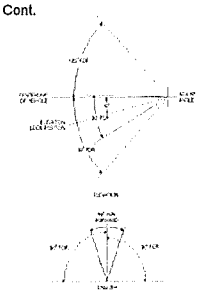
Operate the DVE

Sensor Assembly Cont.

- **Field Of Regard (FOR):** +/- 90° Left and Right Azimuth /+25° to -30° Elevation (Area that can be examined while slewing through normal left/right up/down limits)
- Can detect a standing person or a 22-inch (55.9 centimeter) object at 360 feet (110 meters)
- Operates from a single input voltage of 16 to 32 VDC
- **Field Of View (FOV):** 40° Azimuth x 30° Elevation
  (Angular area visible through an optical instrument)



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Operate the DVE

Electronic Pan Tilt Module and Control Module

- Houses the Sensor Assembly (SA)
- SA/PTM cable connects to PTM/DCM interconnect cable connector
- Gives desired FOV when viewing a selected area
- Allows for manual movement of SA thru the FOR

• Width	9.00 inches (Maximum)
• Height	9.18 inches (Maximum)
• Depth	4.31 inches (Maximum)
• Weight	5.70 pounds (Maximum)

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Operate the DVE

Controller Module (CM)

- Azimuth Control – Rotates PTM ± 90°
- Elevation Control – Adjusts the Sensor Assembly elevation FOR from +25° to -30°
- Azimuth lock – Locks PTM at 0° azimuth (driving) position when engaged
- Elevation lock – Locks Sensor Assembly at - 12°el–vatin (driving) position when engaged

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Operate the DVE

ELO B

ACTION: Identify the controls, indicators and connectors of the AN/VAS- 5A DVE

CONDITION: In a classroom environment, given a DVE training device, TM 11-5855-311-12&P-2

STANDARD: Identify the controls, indicators and connectors of the DVE IAW the operator manual

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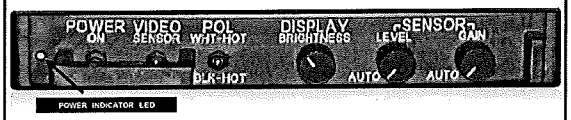
Operate the DVE

Display Control Module (DCM) Controls and Functions



Power Switch - Two position toggle switch

- Applies power to DVE when set to ON (up position). When power is applied, the LED power indicator is illuminated
- Time necessary for maximum image clarity will depend on temperature

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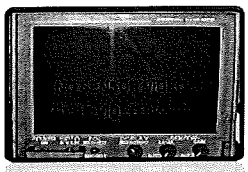
Operate the DVE

Display Control Module (DCM) Controls and Functions (cont.)



VIDEO SENSOR/EXT switch -Two position toggle switch

- In the SENSOR position, selects the sensor video in the DVE. In the EXT position, selects an external video input
- If "NO SENSOR VIDEO – CHECK VIDEO SWITCH" message is displayed, video source is not present

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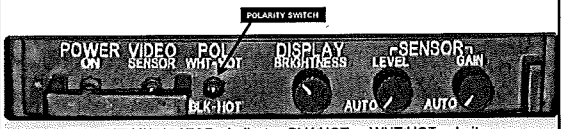
Operate the DVE

Display Control Module (DCM) Controls and Functions



POLARITY INDICATOR - Indicates BLK-HOT or WHT-HOT polarity. Coincides with first block of grayscale

Up position is WHT-HOT	Down position is BLK-HOT
Objects radiating more IR energy appear brighter	Objects radiating more IR energy appear darker
May not be best when background is very hot	

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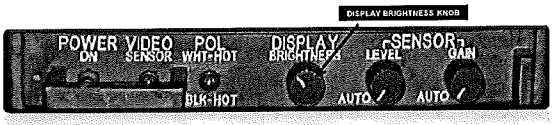
Operate the DVE

Display Control Module (DCM) Controls and Functions



DISPLAY BRIGHTNESS control - Increases background lighting on the display with clockwise (cw) rotation of control and decreases background lighting on display with counterclockwise (ccw) rotation of control.

- Adjusts the brightness of the display backlight
- Adjusted too high could result on loss of useful video information
- Affects the display and Power Indicator LED, not the source video
- Operator's experience and personal preference determine best setting
- Lowest comfortable brightness level is recommended (light discipline)

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Operate the DVE

Display Control Module (DCM) Controls and Functions

SENSOR LEVEL Manual /AUTO – Manual adjustment of video level Automatic adjustment of video level

- Adjust to view images having very high thermal differences (e. g. vehicles, factories, or fires)
- Adjust to view images having very low thermal differences (e. g. Featureless desert or wet fields during or following a rain)
- For additional picture clarity, driver may move Auto LEVEL out of detent to manual and adjust for best image while stationary
- System will Auto Cal the picture in the manual position set by driver. Video may freeze for a fraction of a second

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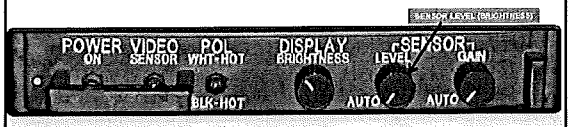
Operate the DVE

Display Control Module (DCM) Controls and Functions



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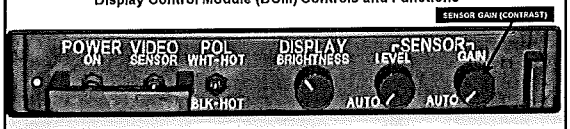
Operate the DVE

Display Control Module (DCM) Controls and Functions



SENSOR GAIN Manual /AUTO – Manual adjustment of video gain Automatic adjustment of video gain

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- Adjust to view images having very low thermal differences (e. g. Featureless desert or wet fields during or following a rain)
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- System will Auto Cal the picture in the manual position set by driver. Video may freeze for a fraction of a second

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Operate the DVE

Display Control Module (DCM) Controls and Functions

SENSOR GAIN Manual /AUTO – Manual adjustment of video gain Automatic adjustment of video gain

- Provides the best image for most driving conditions
- Enhances and refines the picture
- Knob must be in full counterclockwise AUTO detent position
- Sensor video contrast is adjusted automatically
- It determines the hottest and coldest extremes and adjusts the video gain accordingly

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Operate the DVE

Display Control Module (DCM) Connectors and Function

- **Video out (A1J5)** – Provides video output to auxiliary equipment
- **Digital Interface (A1J4)** – Provides for external control of sensor assembly
- **Sensor (A1J2)** – Provides power input to sensor assembly
- **Ext Video In (A1J3)** – Provides for input of external video to display
- **Ext Video Out (A1J6)** – Provides for output of display video to auxiliary equipment
- **Power (A1J1)** – Provides power input to display

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Operate the DVE

ELO C

ACTION: Identify the basic thermal theory of the AN/VAS-5A DVE

CONDITION: In a classroom environment, given a DVE training device, TM 11-5855-311-12&P-2

STANDARD: Identify the basic thermal theory of the AN/VAS-5A DVE IAW the operator manual

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Operate the DVE

Basic Thermal Theory

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Operate the DVE

THERMAL IMAGING SYSTEM (TIS) DVE-FOS

Night Vision Devices (NVD's) allow you to see objects in both the Visible and Near-Infrared spectrum

NVD's require ambient light to operate and are not designed to provide drivers the ability to see through environmental conditions

DVE does not require ambient light and is intended for vehicle operators to see through environmental obscurants, including rain, smoke, fog, haze, etc

DVE allows the Operator to see objects in the Thermal-Infrared spectrum, which does not use light, just thermal energy

The key difference between Thermal-IR (DVE-FOS) and Near-IR (NVD's) is that Thermal-IR energy is **Emitted** by an object instead of **Reflected** off an object

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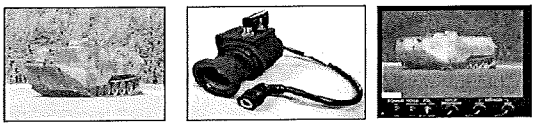
Operate the DVE

THERMAL IMAGING SYSTEM (TIS)



A Thermal Imaging System:

- **Detects** IR energy radiation from scene
- **Converts** IR energy to corresponding electrical signals for processing
- **Generates** a visible image representative of the IR scene

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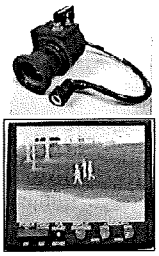
Operate the DVE

THERMAL IMAGING SYSTEM (TIS) (cont.)

Passive system
- Does not emit or transmit signals of any kind
- Only collects IR energy from scene

Ignores visible light input
- Only sensitive to IR energy

Versatile
- Effective 24 hours a day
- Enhances vision during poor visibility conditions
- Able to see camouflaged objects



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Operate the DVE

Thermal Theory Definitions

Ultraviolet light is the radiation from the sun that causes a sunburn

Visible light is the light that we can see and is the only light detectable by the human eye

Infrared radiation is what we like to describe as heat. We can't see infrared waves, but we can feel them. Your body gives off heat, so it is an emitter of infrared radiation

Microwaves are used in radar and also in your microwave oven

Radio waves are found at the longest wavelengths on the electromagnetic spectrum

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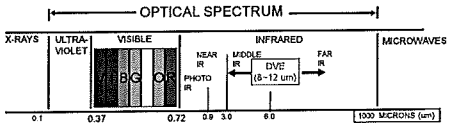
Operate the DVE

Optical Spectrum

All objects above absolute zero (-273.15° C / -459.67° F) emit Infrared Radiation (IR) that is an invisible form of light beyond the visible spectrum



- The optical spectrum is part of the electromagnetic energy spectrum
- IR is a part of the optical spectrum which consist of ultraviolet, visible, and infrared energy
- Only a small part of the optical spectrum is visible to the unaided eye
- The DVE can detect energy in the mid- to far-infrared portion of the optical spectrum

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Operate the DVE

Solar Energy

- The Sun emits solar energy across the entire energy spectrum
- Solar energy encounters surface objects
- Some energy is absorbed and stored as heat (thermal energy)
- After sunset, the thermal energy remains and is emitted as IR energy

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Operate the DVE

Heated Objects

Along with radiation, thermal energy can be absorbed or transferred through:

- **Conduction** or the transfer of heat between two parts of a stationary system, caused by a temperature difference between the parts
- **Convection** or the transfer of heat by the circulation or movement of the heated parts of a liquid or gas

The temperature of an object depends on amount of thermal energy absorbed

Heated objects emit IR radiation

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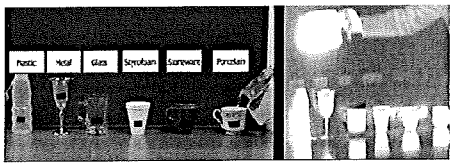
Operate the DVE

IR IMAGES

EMISSIVITY

Emissivity is a measure of an object's ability to emit radiation

Objects emit absorbed IR energy at different rates based on their surface properties



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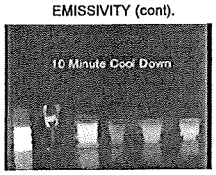
Operate the DVE

IR IMAGES

EMISSIVITY (cont).



Objects that are the same temperature may not emit the same amount of IR energy because they have different levels of emissivity

Objects with **higher** emissivity will emit **more** IR energy and appear hotter when viewed on the DCM

Objects with **lower** emissivity will emit **less** IR energy and appear colder when viewed on the DCM

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Operate the DVE

IR IMAGES

INTENSITY

Intensity of IR energy radiation from any object depends on two factors:

- **Temperature** - amount of thermal energy absorbed
- **Emissivity of object** - rate that the object emits IR energy

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Operate the DVE

IR IMAGES

ATTENUATION = Air Composition + Density + Distance Traveled

- A Thermal Imaging System must receive the IR energy from the environment
- IR energy is attenuated (degraded) by air composition, density, and distance traveled
- IR energy can travel through most obscurants better than visible light

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Operate the DVE

IR IMAGES

ATMOSPHERIC TURBULENCE

Twinkling and Shimmering

- Affects line-of-sight through air near heated surfaces, such as a desert floor or asphalt road
- Affects stability and clarity of image, may cause image to appear to move or be unfocused

If possible, to avoid atmospheric turbulence, wait for cooling temperatures

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Operate the DVE

IR IMAGES

DIURNAL CYCLE

The period of time, after sunrise or sunset, when passive objects approach the same temperature as the background

- **Sunrise:** Objects begin to absorb thermal energy and increase in temperature
- **Sunset:** Objects begin to lose thermal energy and decrease in temperature

NOTE: The DIURNAL CYCLE is also known as the CROSSOVER PERIOD

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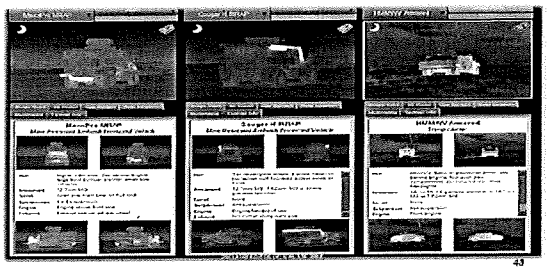
Operate the DVE

THERMAL SIGNATURES

VIEWING ANGLES

Viewing angle affects appearance of the thermal signature and the intensity of radiated IR. View flat sided objects as close to perpendicular as possible



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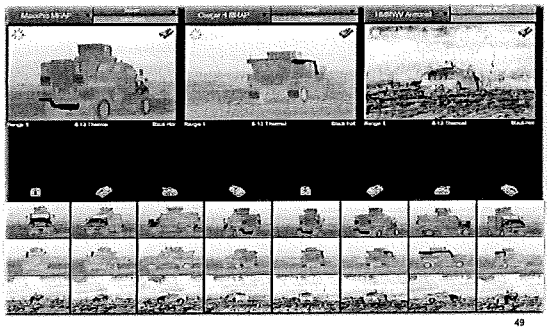
Operate the DVE

VIEWING ANGLES



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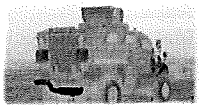
Operate the DVE

THERMAL SIGNATURE

POLARITY DIFFERENCES

White Hot objects in the scene appear lighter on a darker background

Interpretation of thermal images comes with experience and practice



Black Hot objects in the scene appear darker on a lighter background

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Operate the DVE

THERMAL SIGNATURE (cont.)

Man-made objects present distinct identifiable thermal signatures different from the natural environment

Combustion, friction, and body heat provide thermal signatures for mechanical and living objects

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Operate the DVE

ENVIRONMENTAL EFFECTS

- Moisture:
  - Cools objects down
  - Fog or clouds are very poor IR transmitters
  - High humidity may cause degradation
  - Amount and intensity of rain determines degree of TIS degradation
- Overcast Sky:
  - Reduces solar energy absorbed by environment
  - Surface temperatures tend to become unvarying, causing reduced image contrast
- Particulates: (dust, haze, smog, smoke, aerosols, etc.)
  - Causes degradation of thermal imagery
  - Amount of degradation depends on size, type, and concentration of particles
- Surface reflections:
  - Causes deceptive imagery -- Smooth, glossy surfaces (windows, mirrors, still water) can produce strong reflections of IR energy from other sources

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Operate the DVE

ELO D

ACTION: Prepare the AN/VAS-5A Driver's Vision Enhancer (DVE) for operation

CONDITION: In a classroom environment/ maintenance bay, given a DVE, operator manual, designated vehicle

STANDARD: Prepare the AN/VAS-5A Driver's Vision Enhancer (DVE) for operation IAW the operator manual

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Operate the DVE

Unstow and Setup Procedures

The DVE System should be inspected and PMCS conducted each time it is unstowed or stowed

Inspect the DVE to ensure that the unit is in good physical condition; inspect all components for surface damage that may have occurred during shipment/storage, including the environmental seal, if applicable

For missing or damaged components, refer to the Army forms and procedures used for equipment maintenance, as prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS). Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10 (Quality Deficiency Report)

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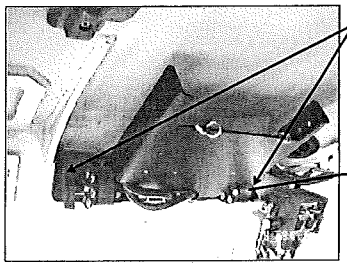
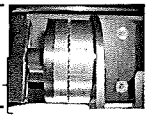
Operate the DVE

Unstow Procedures



Loosen two DCM locking knobs

Push DCM mount to the right and lower mount



Tighten two DCM locking knobs

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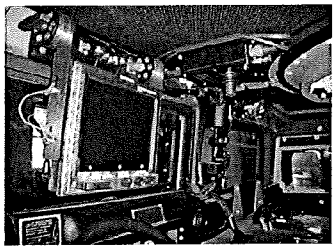
Operate the DVE

Unstow Procedures



Unstowed Position

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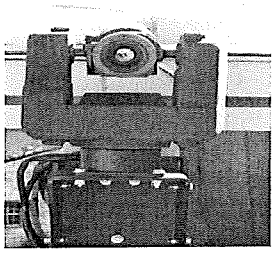
Operate the DVE

Sensor Assembly Installation



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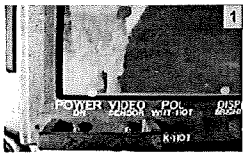
Operate the DVE

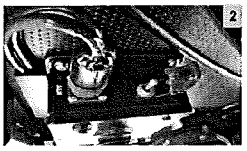
Sensor Assembly Installation

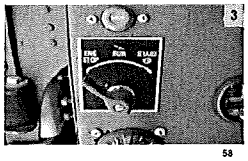


1

Ensure power is off before installing the DVE System

1. DCM
2. CM
3. Vehicle





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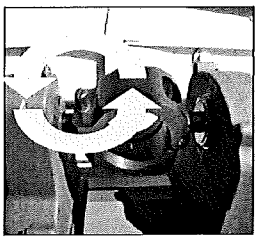
Operate the DVE

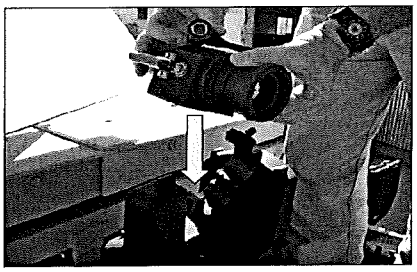
Sensor Assembly Installation



59

Operate the DVE

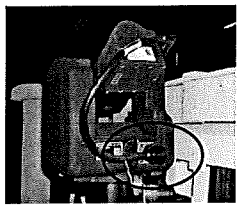
Sensor Assembly Installation



60

Operate the DVE

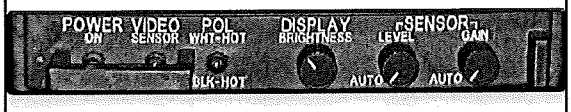
Sensor Assembly Installation



61

Operate the DVE

Initial Setup Settings



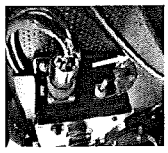
- Rotate SA azimuth and elevation to straight ahead and level 0 degree position
- Set DVE POWER switch to OFF (down position)
- Set VIDEO switch to SENSOR (up position)
- Set POL switch to WHT-HOT (up position)
- With DISPLAY BRIGHTNESS control turned fully Counterclockwise (CCW), rotate knob approximately ¼ turn Clockwise (CW) 11 0'clock
- Set SENSOR LEVEL and SENSOR GAIN controls to fully Counterclockwise (AUTO) detent position

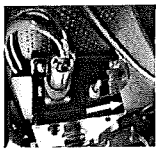
62

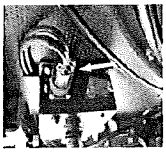
Operate the DVE

Initial Setup Settings

Open Switch Protector | Flip Power Switch to Right | Close Switch Protector







- Place the Power Switch on the CM to the ON position. CM sends a signal to the DCM to pick-up the AZ/EL screen settings for viewing

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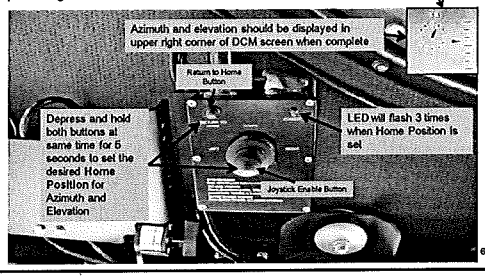
Operate the DVE

Initial Setup Settings

- Set POWER to "ON" on the DCM when ready to use
- If the Azimuth and Elevation Indicators are not visible on the DCM, power down both systems and repeat process, ensuring CM is powered on prior to powering on DCM



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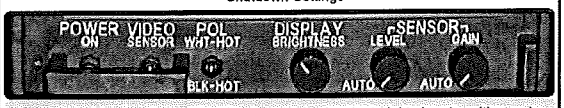
Operate the DVE

Shutdown Settings



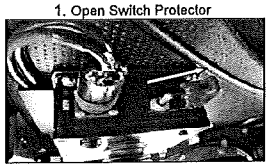
- Set the SA azimuth and elevation to locked azimuth straight ahead position and 0 degree elevation position
- Set SENSOR LEVEL and SENSOR GAIN controls to fully Counterclockwise (AUTO) detent position
- With DISPLAY BRIGHTNESS control turned fully Counterclockwise, rotate knob approximately ¼ turn Clockwise
- Set POL switch to WHT-HOT (up position)
- Set VIDEO switch to SENSOR (up position)
- Set POWER switch to OFF (down position)

65

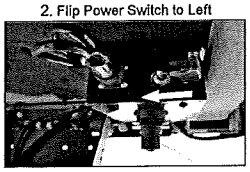
Operate the DVE

Shutdown Settings

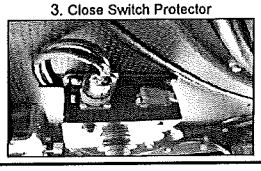
1. Open Switch Protector



2. Flip Power Switch to Left



3. Close Switch Protector



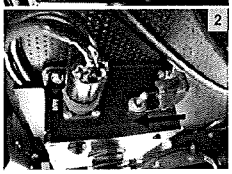
66

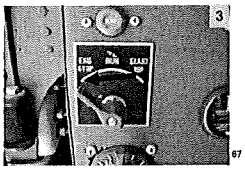
Operate the DVE

Shutdown Settings

Ensure power is OFF before removing DVE System

1. DCM
2. CM
3. Vehicle





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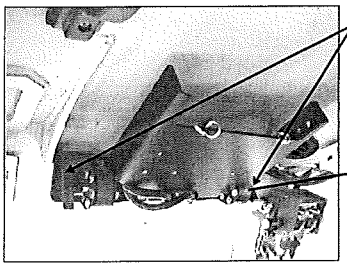
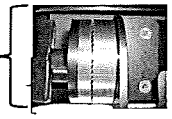
Operate the DVE

Stow Procedures



Loosen two DCM locking knobs

Push DCM mount to the right and raise mount



Tighten two DCM locking knobs

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Operate the DVE

ELO E

ACTION: Perform PMCS and troubleshooting procedures on the AN/VAS-5A Driver's Vision Enhancer (DVE)

CONDITION: Given a DVE, TM 11-5855-311-12&P-2, designated vehicle, DVE

STANDARD: Perform PMCS and troubleshooting procedures on the DVE IAW TM 11-5855-311-12&P-2

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Operate the DVE

PMCS Procedures

Operator PMCS

Preventive maintenance checks and services consist of a visual check for physical damage and routine cleaning services. Frequency of this task varies with the operating environment and should not require more than six minutes. The PMCS Table is divided into three main columns

Thoroughly inspect the DVE when it is unstowed and stowed. Inspect for existing damage or conditions that might result in further damage or malfunction. Inspect the unit, as described in Table 2-3 of the operator manual, to ensure a complete examination

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Operate the DVE

PMCS Procedures

Corrosion Prevention and Control

(1) Corrosion prevention and control of Army material is a continuing concern. It is important that corrosion problems with this equipment be reported so that the problem can be corrected and improvements made to prevent the problem in future equipment

(2) While corrosion is typically associated with rusting metal, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling or breaking of these other materials may be a corrosion problem

(3) If a corrosion problem is identified, report it using SF 368, Product Quality Deficiency Report

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Operate the DVE

PMCS Procedures

Cleaners and Chemicals

(1) Give cleaners / chemicals special care

(2) Keep cleaners / chemicals in approved safety containers and in minimum quantities

(3) Some cleaners / chemicals may have an adverse effect on the skin, eyes and respiratory tract. Observe manufacturers' WARNING labels and current safety directives

(4) Use cleaners / chemicals only in authorized areas. Discard soiled clothes into safety containers

(5) Consult the local Bioenvironmental Engineer and/or Material Safety Data Sheets (MSDS) for specific precautions, protective equipment, hazardous material (i.e. Ozone Depleting Substances), components and ventilation requirements

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Operate the DVE

PMCS Procedures

Cleaning Exterior Surfaces

The DVE should be cleaned using only approved materials listed in Appendix F of the operator manual. If unit is not kept clean, performance may be degraded, and dust, grease or other foreign matter may hide relatively obvious defects that would be noted in a visual inspection

- Mild Liquid Soap
- Wiping Cloth
- Soft Cloth
- Commercially available equivalents; computer monitor wipes, camera lens cleaning kit

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Operate the DVE

PMCS Procedures

Cleaning Exterior Surfaces (cont.)

- Use a dry, clean, cloth to remove dust, dirt, grease, moisture, or other foreign matter from the exterior surface
- If the foreign matter cannot be removed using a dry, clean, cloth then dampen a clean cloth with a solution of mild liquid general purpose detergent mixed in warm water and clean all surfaces. Dry with a clean, dry cloth
- Remove fingerprints, oil spots, and dirt by dabbing glass with soft cloth, moistened, not saturated with lens cleaning compound

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Operate the DVE

PMCS Procedures

Cleaning Optical Surfaces

- Start at center of IR lens or DCM screen and wipe toward outside of glass. Keep clean area of cloth against glass surface by turning after each stroke or using a clean cloth after both sides have been used
- If the optical surface remains contaminated, use a clean cloth and repeat steps 1 and 2
- Normal hand pressure may be used to rub glass when cleaning

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Operate the DVE

PMCS Procedures

Cleaning Exterior Surfaces (cont.)

CAUTION

- Ensure that cleaning compound remains uncontaminated
- DO NOT use excessive hand pressure when rubbing IR lens or DCM screen
- DO NOT use ammonia base cleaners

WARNING

- DO NOT touch, ingest, or inhale particles of a broken IR lens of the SM. This lens contains Germanium, which is slightly toxic if ingested or inhaled. Glass may be sharp enough to cut personnel if touched
- Vacuum or sweep up material and place into a suitable zip-lock bag. Avoid ingestion and inhalation. Dispose of Germanium lenses through your supply channels in accordance with local environmental regulations

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Operate the DVE

Operator Troubleshooting

Table 2-4 in the operator manual lists the common malfunctions that may occur. Table 2-4 does not list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault

If the equipment malfunction is not listed or the actions listed does not correct the fault, forward the entire system, to include all items referenced in Appendix C, to higher level of maintenance

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Operate the DVE

ELO F

ACTION: Apply wheel indicators

CONDITION: Given a classroom, maintenance bay, DVE, TM 11-5855-311-12&P-2, vehicle

STANDARD: Apply wheel indicators on the AN/VAS-5A DVE IAW the wheel indicator TTP

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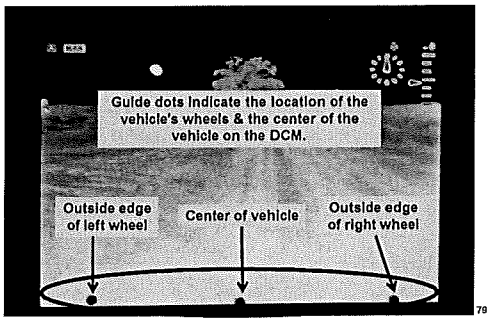
Operate the DVE

Applying Wheel Indicators

Guide Dots



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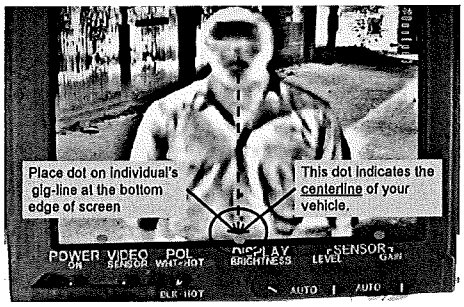
Operate the DVE

Applying Wheel Indicators

Center Dot



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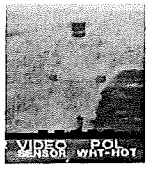
Operate the DVE

Applying Wheel Indicators

Left Wheel Dot

Stand at the very center directly in front of the left wheel, far enough from the vehicle that the driver can see their feet on the DCM.



Slowly walk forward until his feet are just touching the bottom edge of the screen. Place a dot center of feet.

Place a dot in the center of your buddy's feet. This dot indicates the center line of your left tire.

NOTE: Repeat the same steps for the right side of the vehicle

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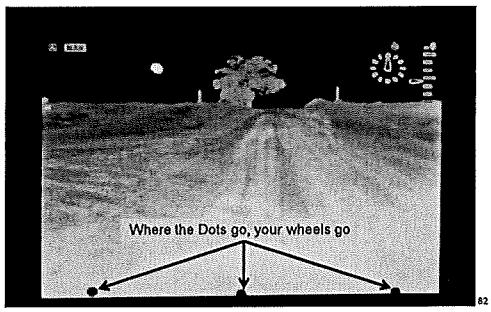
Operate the DVE

Applying Wheel Indicators



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Operate the DVE

TLO

ACTION: Operate the AN/VAS-5A DVE

CONDITION: Given a classroom/maintenance bay, DVE, TM 11-5855-311-12&P-2, vehicle

STANDARD: Operate the AN/VAS-5A IAW TM 11-5855-311-12&P-2

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